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**AQUA VIRGINIA, INCORPORATED  
LAKE LAND'OR WASTEWATER TREATMENT PLANT**

**COPPER AND ZINC MONITORING PROGRAM REPORT**

*Prepared for:*

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## SECTION 1.0

### INTRODUCTION

#### 1.1 Background

The Lake Land 'Or Wastewater Treatment Plant (WWTP) is owned and operated by Aqua Virginia, Incorporated and provides residential wastewater treatment services to the Lake Land'Or community and surrounding residential developments in Caroline County. Treated wastewater is discharged to an unnamed tributary of the South River in accordance with the provisions of VPDES Permit No. VA0025020. In the mid-2000s, the WWTP experienced exceedences of the biochemical oxygen demand, total suspended solids, total kjeldahl nitrogen, and ammonia effluent limits contained in the VPES permit. To address these issues, Aqua Virginia entered into a Special Order by Consent (Consent Order) with the Virginia Department of Environmental Quality (DEQ) to expand the treatment plant to facilitate compliance with the permit effluent limitations. The Order established interim effluent limits that remained in effect until the wastewater treatment plant expansion was completed.

Concurrent with the Consent Order development, the VPDES permit for this facility was modified to add a new 0.22 MGD tier for an expanded facility and new effluent monitoring requirements and limits were developed for the new tier. Since the expanded treatment system was not in place when the permit was modified, data from the old 0.1 MGD treatment system was used to calculate the effluent limits for the 0.22 MGD facility. This included the use of total recoverable copper and zinc data (presumably since dissolved copper and zinc data were not available) and hardness data for the old treatment process. The sampling and analyses for these previously generated data were performed using routine techniques and therefore may have been subject to contamination that affected the accuracy of the data.

In early 2009, Aqua Virginia completed the construction of the improved and expanded treatment system in advance of the Consent Order deadline to allow the facility to expand from the prior 0.1 MGD capacity to the current 0.22 MGD capacity. This improved treatment process incorporated a Modified Ludzak Ettinger (MLE) biological nutrient removal (BNR) process to facilitate enhanced nutrient removal. The new treatment process included lime addition to offset the wastewater alkalinity lost through biological nitrification; this also resulted in an increase in wastewater hardness.

The current VPDES permit for this facility will expire on December 20, 2009 and an application for permit reissuance was recently submitted to DEQ by Aqua Virginia. Since effluent quality and characteristics for the new treatment system are believed to be significantly different (better) than that from the prior treatment process, the previously generated copper and zinc data is not believed to be representative of that for the new treatment system. To support the permit reissuance process and to support a re-evaluation of the need for copper and zinc limits, Aqua Virginia conducted an effluent copper and zinc monitoring program to provide representative copper, zinc, and hardness data for the new treatment discharge. This monitoring program was performed using "clean" sampling and analysis protocols to minimize the potential for contamination and to provide current, accurate and representative effluent data. The performance and results of the monitoring program as well as an evaluation of the need for copper and zinc permit limits are summarized in this report. This includes the laboratory reports and chain-of-custody documents as well as the printouts from the site-specific water quality criteria development program and the statistical evaluations of the need for permit limits for copper and zinc.

## 1.2 Objectives

The objectives for the copper and zinc monitoring program for the Lake Land'Or WWTP include:

1. Collection and analysis of a series of effluent samples using clean or modified clean monitoring procedures to provide total recoverable and dissolved copper and zinc data that accurately represents current effluent quality for the improved treatment process;
2. Collection and analysis of sufficient numbers of effluent samples to provide for the use of sample group-specific coefficient of variation data in the evaluation of the need for copper and zinc limits;
3. Collection and analysis of effluent samples to provide effluent hardness data representative of the new treatment process;
4. Analysis of the effluent samples using EPA-approved methods capable of providing accurate copper and zinc measurements in the low parts per billion range;
5. The establishment of site-specific water quality criteria for copper and zinc for the Lake Land'Or WWTP using current effluent hardness; and
6. Re-evaluation of the need for copper and zinc effluent limits based on the use of current, accurate and representative effluent monitoring data.

## SECTION 2.0

### METHODS

#### 2.1 Sample Collection

##### 2.1.1 Sampling Equipment Preparation

To minimize the potential for trace sample contamination and to increase the accuracy of the low-level metals analyses, “clean” sampling and analytical techniques were utilized for this monitoring program. This included the use of pre-cleaned, tested and certified sampling equipment, containers, and reagents along with specialized sampling protocols to minimize the potential for sample contamination during collection.

New sample bottles, tubing, and filters were used for sample collection for this project. The HDPE sample bottles were cleaned by Olver Incorporated staff with reagent-grade nitric acid, rinsed with deionized water, filled with a high-purity (Trace Metal Grade) nitric acid and deionized water solution and allowed to soak for 18 to 24 hours, emptied, and rinsed again with deionized water. The precut and assembled Teflon and peristaltic pump tubing were cleaned in a similar manner. High purity nitric acid was added to the sample containers as a preservative and the bottles were sealed and placed in Ziploc bags. Likewise, the cleaned tubing was sealed in large Ziploc bags. All bags were given unique labels to facilitate tracking.

To verify the effectiveness of the cleaning processes, representative sample containers were selected from the cleaned bottles and were filled with high purity deionized water provided by the laboratory; these samples were sent to the laboratory for low-level copper and zinc analyses to document the effectiveness of the cleaning processes. Similarly, high purity deionized water was run through representative tubing assemblies and transferred to cleaned containers. These were also sent to the laboratory for low-level copper and zinc analyses to document the effectiveness of the cleaning process.

The 0.45 µm high capacity cartridge filters used for this project were selected based on prior experience for trace metals monitoring. To confirm the adequacy for this application, high purity deionized water provided by the laboratory was run through the filter and captured in a sample bottle cleaned and preserved as described above and the filtrate was sent to the laboratory for low-level copper and zinc analyses.

Upon confirmation of the cleaning acceptability, sampling kits were prepared for the 12 monitoring events. The cleaned sample bottles, tubing, trip blanks, and high purity deionized water provided by the laboratory (for use in preparing the field blanks) were placed in each of the 12 coolers for use by the sampling staff.

#### 2.1.2 Sampling Schedule

Effluent monitoring for the new wastewater treatment process was initiated in late May 2009 after the new process was in operation for over 3 months. This delay in initiating sample collection provided the opportunity for the treatment process to stabilize and the data to reflect current operations of the new facility. To account for any variability in effluent quality, a total of 12 samples were collected on an approximately weekly basis from the Lake Land'Or Wastewater Treatment Plant from late May through late September, a period of approximately 5 months. This sampling schedule was also established to provide for the submittal of the monitoring data for use by DEQ staff as part of the ongoing permit reissuance process. Sample collection was not performed from late July through late August due to sampling staff vacations and lime feed system corrections.

#### 2.1.3 Sample Collection

All samples collected as part of this copper and zinc monitoring program were collected by C.E. Wise, Incorporated. Prior to the initiation of sample collection, C.E. Wise staff participated in a training program for the collection of "clean" samples to ensure the correct application of clean sampling techniques for this program. A sampling summary that

addresses the general elements of the sampling protocol was provided to the sampling technician in conjunction with the sampling training; a copy is included in Appendix A.

For each of the twelve sampling events, Outfall 001 effluent grab samples were collected using a peristaltic pump and the precleaned tubing assemblies for dissolved and total recoverable copper and zinc analyses. The samples for dissolved metals analyses were pumped through a new 0.45 µm pore size high capacity cartridge filter; the samples for total recoverable metals analyses were pumped directly in the sample bottles without filtration.

After the initial collection of the total and dissolved metals field blanks (described in Section 2.1.4), the sampling assembly was flushed to remove any residual deionized water by pumping Outfall 001 effluent through the tubing and filter and discarding the first liter of filtered effluent. The dissolved metals sample was then collected by directing the pumped filtrate into a cleaned sample container. Immediately following the collection of the dissolved metals sample, a total metals sample was collected by removing the filter from the tubing and directing the Outfall 001 effluent into a second cleaned sample container. All samples were preserved with high purity nitric acid (previously added to the containers), the sample containers were returned to their Ziploc bags, sealed, and placed in coolers for shipment via an overnight carrier to the laboratory.

In conjunction with the collection of samples for metals analyses, effluent samples were also collected for the determination of hardness. The hardness sample was placed in a sample bottle and placed in the cooler for shipment to the laboratory.

#### 2.1.4 Field Quality Assurance/Quality Control

To determine if sample contamination occurred during the sample collection and analyses processes, a trip blank and two field blanks were prepared and analyzed in conjunction with each Outfall 001 monitoring event. The trip blank was prepared by Olver Incorporated staff in conjunction with the preparation of the sampling kits; high purity

deionized water provided by the laboratory was poured into a cleaned and certified sample bottle and one bottle was placed in each sampling kit. The field blanks were prepared in the field in conjunction with the collection of the Outfall 001 effluent samples. Field blanks were prepared for both total and dissolved copper and zinc analyses prior to the collection of the effluent samples (described in Section 2.1.3) by pumping high purity water provided by the laboratory into cleaned and certified sample containers using the same sampling apparatus used for the collection of the effluent samples. The field blank for total metals analyses was collected upon initial setup of the sampling apparatus and was not filtered; the field blank for dissolved metals analyses was collected immediately after the total metals field blank by adding the high capacity cartridge filter to the sampling tubing and pumping the deionized water through the same cartridge filter. This apparatus was then used to collect the Outfall 001 dissolved and total metals samples. All field blank samples were preserved with high purity nitric acid (previously added to the containers), the sample containers were returned to their Ziploc bags, sealed, and placed in coolers for shipment via an overnight carrier to the laboratory. In addition to the collection and analysis of field and trip blanks, chain-of-custody documentation and field notes were completed for each sampling event.

## 2.2 Sample Analyses

All effluent samples were analyzed by Aqua Pennsylvania, Incorporated in Bryn Mawr, Pennsylvania. This laboratory is certified by the Virginia DCLS to provide potable water analysis (Certification No. 00056) and provides wastewater analyses for NPDES permit compliance programs. All analyses were performed in accordance with methods referenced in 40 CFR Part 136, summarized as follows:

Parameter	Analytical Method	Method Designation	Reporting Limit
Copper	Inductively Coupled Plasma-Mass Spectrometry	EPA 200.8	1.0 µg/L
Zinc	Inductively Coupled Plasma-Mass Spectrometry	EPA 200.8	1.0 µg/L
Hardness	Titration	SM 2340C	10 mg/L

As depicted, the reporting limits for the copper and zinc analyses were less than the quantification levels of 3.0 µg/L for copper and 22 µg/L for zinc established in the modified VPDES permit for this facility.

### **2.3 Monitoring Data Evaluation**

The copper and zinc data for each monitoring event were examined to ensure the Outfall 001 monitoring results were accurate and not influenced by contamination. The reported copper and zinc concentrations in the trip blank and field blank samples for each event were examined for evidence of contamination and were compared to the results of the corresponding dissolved and total recoverable metals analyses. Similarly, the dissolved and total recoverable metals results were evaluated for the potential for sample contamination during filtration (i.e. dissolved metals greater than total recoverable). Typically, field or trip blank data at or near the reporting level was not considered to be an indicator of sample contamination during collection or analysis. Any data indicative of contamination at levels believed to be significant to the overall evaluation were excluded from further evaluation.

### **2.4 Permit Limits Evaluation**

As part of the permit limits evaluation process, the site-specific waste load allocations (WLAs) for copper and zinc were determined. The allocations were calculated using the DEQ MSTRANTI spreadsheet with current average effluent hardness and the receiving stream data from the 2007 permit modification fact sheet for the 0.22 million gallons per day (MGD) WWTP. Hardness data were calculated as the average of the 12 measurements made in conjunction with the collection of the effluent copper and zinc data. As for the prior WLA calculations performed by DEQ in conjunction with the 2007 modification, these calculations were performed using 1Q10 = 0 MGD, 7Q10 = 0 MGD, and 30Q10 = 0 MGD for the receiving stream flows. All other input parameters used in 2007 were included in this evaluation.

Once the copper and zinc acute and chronic WLAs were calculated, these values were used in conjunction with the dissolved copper and zinc data to evaluate the need for permit limits. These evaluations were conducted using the DEQ “Statistically Derived Permit Limits” program. For copper, all twelve data points were used in these evaluations. For zinc, the evaluations were performed using all data points; the evaluation was repeated without the July 17, 2009 data point that was excluded due to the potential for sample contamination during the collection process. This potential for contamination was based on the measurement of 12 µg/L in the corresponding dissolved metals field blank for this sampling event.

## SECTION 3.0

### RESULTS

#### 3.1 Equipment Preparation Monitoring Results

The results of the equipment cleaning tests indicated that copper and zinc were not present in the randomly selected sample bottles. A trace amount of zinc was detected in the tubing sample but the level was greater than a factor of 10 below the expected concentration in the WWTP effluent. The analysis of the high purity laboratory water that was passed through the randomly selected 0.45 µm cartridge filter showed copper and zinc was not present in the filtrate and the filters were acceptable for use in this monitoring program. The results of the initial cleaning confirmation analyses are provided in Appendix B.

#### 3.2 Analysis Results

The results of the Outfall 001 copper and zinc monitoring using clean monitoring protocols as well as the results of the corresponding trip and field blank analyses are summarized in Table 1. As depicted, dissolved copper ranged from 1.5 µg/L to 5.2 µg/L; dissolved zinc ranged from 22 µg/L to 60 µg/L; and hardness ranged from 80 mg/L to 156 mg/L. The lowest hardness readings occurred during a period when the lime feed system was experiencing clogging issues that are believed to have been corrected. On average, dissolved copper represented 84% of the total copper while dissolved zinc represented 91% of the total zinc.

The results of the trip and field blank analyses indicated that with the possible exception of one monitoring event, the collection and analyses were not influenced by sample contamination. The trip blanks were consistently near or below the respective copper and zinc reporting limits. With the exception of the July 17 monitoring event, copper and zinc were not detected in any of the dissolved metals field blanks. Dissolved zinc was reported as 12 µg/L for the July 17 field blank; copper was not detected in this sample and the

**Table 1**  
**Monitoring Results Summary**

Sample Event No.	Collection Date	Sample	Copper (ug/L)	Zinc (ug/L)	Hardness (mg/L)
1	5/27/2009	Trip Blank-Total	<1.0	<1.0	156
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	<1.0	
		Outfall 001-Dissolved	2.7	33	
		Outfall 001-Total	2.8	31	
2	6/5/2009	Trip Blank-Total	<1.0	<1.0	145
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	<1.0	
		Outfall 001-Dissolved	1.5	22	
		Outfall 001-Total	1.9	24	
3	6/11/2009	Trip Blank-Total	<1.0	<1.0	147
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	<1.0	
		Outfall 001-Dissolved	2.5	30	
		Outfall 001-Total	2.7	29	
4	6/17/2009	Trip Blank-Total	<1.0	<1.0	124
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	1.3	
		Outfall 001-Dissolved	5.2	60	
		Outfall 001-Total	5.9	62	
5	6/24/2009	Trip Blank-Total	<1.0	<1.0	112
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	2.5	
		Outfall 001-Dissolved	4.6	57	
		Outfall 001-Total	4.9	57	
6	7/6/2009	Trip Blank-Total	<1.0	1.1	111
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	5.8	
		Outfall 001-Dissolved	3.6	58	
		Outfall 001-Total	3.9	65	
7	7/17/2009	Trip Blank-Total	<1.0	1.0	120
		Field Blank-Dissolved	<1.0	12	
		Field Blank-Total	<1.0	<1.0	
		Outfall 001-Dissolved	3.3	51	
		Outfall 001-Total	4.2	56	
8	7/22/2009	Trip Blank-Total	<1.0	1.1	129
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	3.1	
		Outfall 001-Dissolved	4.0	59	
		Outfall 001-Total	4.4	60	
9	8/21/2009	Trip Blank-Total	<1.0	<1.0	80
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	<1.0	
		Outfall 001-Dissolved	3.4	41	
		Outfall 001-Total	4.9	50	
10	9/2/2009	Trip Blank-Total	<1.0	<1.0	130
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	<1.0	
		Outfall 001-Dissolved	4.0	37	
		Outfall 001-Total	5.0	52	



**Table 1**  
**Monitoring Results Summary**

11	6/16/2009	Trip Blank-Total	<1.0	1.1	169
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	<1.0	
		Outfall 001-Dissolved	1.8	43	
		Outfall 001-Total	2.8	54	
12	9/22/2009	Trip Blank-Total	<1.0	1.0	130
		Field Blank-Dissolved	<1.0	<1.0	
		Field Blank-Total	<1.0	<1.0	
		Outfall 001-Dissolved	3.8	57	
		Outfall 001-Total	4.5	61	



corresponding Outfall 001 dissolved zinc result (51 µg/L) was within the range reported for the other eleven events. Total zinc was measured in the field blanks at a concentration above the reporting level in four of the twelve samples. The measured low levels of total zinc in the field blanks do not appear to indicate consistent or significant sample contamination; in accordance with DEQ practices, the Outfall 001 total metals data were not used in the permit limits evaluation. Copies of the laboratory analysis reports and the associated chain-of-custody documents for each of the twelve monitoring events are provided in Appendix C.

### 3.3 Permit Limits Evaluation

#### 3.3.1 Water Quality Standards Calculation

When the average effluent hardness of 129 mg/L was used for the calculation of the acute and chronic waste load allocations for this discharge, the following results were obtained:

Parameter	Acute WLA	Chronic WLA
Copper	17 µg/L	11 µg/L
Zinc	150 µg/L	150 µg/L

A copy of the MSTRANT spreadsheet used to determine these WLA values is provided in Appendix D.

#### 3.3.2 Permit Limits Evaluation

The acute and chronic waste load allocation values were used in conjunction with the dissolved copper and zinc data summarized in Table 2 to evaluate the need for VPDES permit limits for these metals based on current treatment plant effluent characteristics. The result of the evaluation for copper indicates “No Limit is required for this material”. Two evaluations were performed for zinc; the first was performed using all 12 data points and the second was performed excluding the data from the July 17, 2009 sampling event because of the potential for sample contamination. The results of both evaluations for zinc indicated

**Table 2**  
**Outfall 001 Effluent Limits Evaluation Data Summary**

Sample No.	Sample Date	Hardness (mg/L)	Dissolved Copper (ug/L)	Dissolved Zinc (ug/L)
1	5/27/2009	156	2.7	33
2	6/5/2009	145	1.5	22
3	6/11/2009	147	2.5	30
4	6/17/2009	124	5.2	60
5	6/24/2009	112	4.6	57
6	7/6/2009	111	3.6	58
7	7/17/2009	120	3.3	51
8	7/22/2009	129	4.0	59
9	8/21/2009	80	3.4	41
10	9/2/2009	130	4.0	37
11	9/16/2009	169	1.8	43
12	9/22/2009	130	3.8	57
Average		129	3.4	45.7

"No permit limit is required for this material". Copies of the printouts for these evaluations are contained in Appendix E.

## SECTION 4.0

### CONCLUSIONS

In summary, the following conclusions are provided based on the performance and results of the copper and zinc monitoring program for the Lake Land'Or Wastewater Treatment Plant:

- The recent wastewater treatment plant expansion and the corresponding treatment process modifications to incorporate biological nutrient removal have changed the characteristics of the effluent discharged from the Lake Land'Or Wastewater Treatment Plant.
- The results of the monitoring and the corresponding permit limits evaluation described herein and performed using the clean sampling and analysis techniques provide effluent metals and hardness data that is representative of the current effluent quality for this facility.
- The results of the trip and field blank analyses for this monitoring program indicated that any sample contamination during this monitoring program was minimal and did not adversely impact the analytical data.
- Dissolved copper and zinc averaged 3.4 µg/L and 45.7 µg/L respectively over the May through September 2009 study period.
- The average effluent hardness may be conservatively estimated as 129 mg/L based on the monitoring data for the study period.
- The Outfall 001 effluent data from this monitoring program is more appropriate for use in evaluating the need for permit limits than the total metals data used for the 2007 modification.
- The calculation of the acute and chronic water quality standards using current effluent hardness and the corresponding evaluation of the need for effluent copper and zinc limits using clean monitoring data indicate that limits are not necessary for the upgraded and expanded facility.

**APPENDIX A**

**SAMPLING PROTOCOL SUMMARY**



## Lake Land'Or WWTP Clean Metals Sampling Protocol Summary

### Equipment/Supplies

Nitrile Gloves (Clean gloves should be worn throughout the entire process)  
Bottle Kit (Sample bottles, filter, sample tubing, MQ Water, trip blank sample)  
PVC Pipe  
Portable Peristaltic Pump  
Plastic Sheeting  
Power Source (Battery or line power Source)  
Field Notes and Chain-of-Custody Forms

### Sampling Equipment Set-up

Place Plastic sheeting on table and ground (if necessary) and set up pump on table. Set up PVC tubing if necessary to secure the Teflon sampling tube in the Outfall 001 waste stream. Once area is covered with plastic sheeting you can put together the tubing and place it in the pump.

### Sampling Protocol

1. In a manner to prevent contamination, carefully open the bag containing the pre-cleaned Teflon (rigid) and peristaltic pump tubing and attach to the peristaltic pump.
2. Collect the Total Metals Field Blank (FB-Total bottle) by placing rigid end of sample tubing into the MQ bottle (clean lab water), turn pump on and pump until sample bottle labeled FB-Total bottle is full. Cap the bottle and place in Ziploc bag. Indicate on sheet what MQ bottle was used.
3. Place filter on flexible end of sample tubing and pump the rest of the (or open new bottle if necessary) MQ water through tubing and filter; discard waste. Open second MQ bottle and pump approximately  $\frac{1}{2}$  of the water bottle through tubing and filter, discard waste (this is the filter priming step). Next, collect the dissolved Metals Field Blank (FB-Dissolved) by pumping MQ water through tubing and filter until FB-Dissolved bottle is full. Cap bottle and place in Ziploc bag. Leave pump running until there is no liquid flowing from the end of the filter. Indicate which MQ bottles were used for the filter priming and then the FB-Dissolved collection.
4. Collect the Outfall 001 Dissolved sample by placing rigid tubing into the waste stream (may need to use the PVC pipe to secure the tubing in the waste stream) and flush the tubing and filter by pumping approximately 1 liter of wastewater through tubing and filter; discard waste. After flushing 1 liter, collect the filtered effluent in the Outfall 001 Dissolved bottle until it is full.
5. Remove filter from end of tubing. Collect the Outfall 001 Total sample by pumping wastewater through tubing and into the Outfall 001 Total bottle. Cap bottle and place in Ziploc bag.

Please make sure to fill out the Chain-of-Custody and label the bottles with the sample date and time. Ship samples to the Laboratory using the enclosed shipping label, the samples do not need to be placed on ice.

Please call Stephanie Close or Lawrence Hoffman at 540-552-5548 if you have any questions about the sampling protocol.

**APPENDIX B**

**CLEANING CONFIRMATION LABORATORY ANALYSIS REPORT**



**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**AQUA PA MILLIQ WATER, MQ #20 W/O ACID  
LAKE LAND OR WWTP**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146

Phone #: 804-749-8868

Collection Date: 5/21/09  
Collection Time: 10:30  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC22399

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	METALS				
Copper	N.D.	ug/L	5/29/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	5/29/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Nutz*Date: 6/2/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**AQUA PA MILLIQ WATER,MQ #21 ACID  
LAKE LAND OR WWTP**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 5/21/09  
Collection Time: 10:30  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC22400

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper	N.D.	ug/L	5/29/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	5/29/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

  
Date: 6/2/09

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762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**AQUA PA MILLIQ WATER,H#1  
LAKE LAND OR WWTP**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146

Phone # : 804-749-8868

Collection Date: 5/21/09  
Collection Time: 10:30  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC22401

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	INORGANIC_COMPOUNDS				
Hardness	N.D.	mg/L	5/29/09	10	SM 2340C

N. D. = Not Detected

Approved By:

*Charles D. Dwyer*      Date: 6/2/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**B1518**  
**LAKE LAND'OR WWTP PROJECT**Company Address: Olver Incorporated  
1116 S. Main Street  
Blacksburg, VA 24060  
Phone #: 540-552-5548Collection Date: 5/18/09  
Collection Time: 15:15  
PWS I.D. :  
Entry Pt # :  
Sample ID : AC21020

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	5/20/09	1	EPA 200.8
Zinc	N.D.	ug/L	5/20/09	1	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 5/20/09

An Aqua America Company

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**B2518**  
**LAKE LAND'OR WWTP PROJECT**Company Address: Olver Incorporated  
1116 S. Main Street  
Blacksburg, VA 24060  
Phone #: 540-552-5548Collection Date: 5/18/09  
Collection Time: 15:20  
PWS I.D. :  
Entry Pt #:  
Sample ID : AC21021

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	5/20/09	1	EPA 200.8
Zinc	N.D.	ug/L	5/20/09	1	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. HutzDate: 5/20/09

An Aqua America Company

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

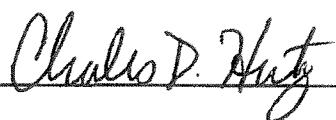
www.aquapennsylvania.com

**TT518/PT518**  
**LAKE LAND'OR WWTP PROJECT**Company Address: Olver Incorporated  
1116 S. Main Street  
Blacksburg, VA 24060  
Phone #: 540-552-5548Collection Date: 5/18/09  
Collection Time: 15:30  
PWS I.D. :  
Entry Pt #:  
Sample ID : AC21022

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	5/20/09	1	EPA 200.8
Zinc	2.2	ug/L	5/20/09	1	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 5/20/09

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**AQUA.**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

---

**FILTER**  
**LAKE LAND'OR WWTP PROJECT****Company Address:** Olver Incorporated  
1116 S. Main Street  
Blacksburg, VA 24060  
**Phone #:** 540-552-5548**Collection Date:** 5/18/09  
**Collection Time:** 15:40  
**PWS I.D.:**  
**Entry Pt #:**  
**Sample ID :** AC21023

---

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper	N.D.	ug/L	5/20/09	1	EPA 200.8
Zinc	N.D.	ug/L	5/20/09	1	EPA 200.8

---

N. D. = Not Detected

Approved By:

*Charles P. Hutz*Date: 5/20/09

An Aqua America Company

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**Aqua Pennsylvania, Inc.**  
762 Lancaster Ave.  
Bryn Mawr, PA 19010-3489  
610-525-1400

**Chain of Custody Record  
Samples for Laboratory Analysis**

Page 1 of 1

Sample Submitted By.: Stephanie Close

Compliance forms needed? YES

NO.

Company Name.....: Oliver Incorporated

### Sample Matrix water

Division Name.....:

wastewater

Address.....: 1116 S. Main Street Blacksburg, VA 24060

Samples rec'd m/s **other:**

Phone #: (540) 552-5548

**CONDITIONS UPON RECEIPT : ( Check One )**

PWS ID:

ICED  Ambient or °C At Receipt

**Samples**

**Sample Preparation**      **Analysis Requested**

**Relinquished By:** (signature) 

Date/Time

Received By (signature)

Date/Time:

### Comments

---

**Special Instructions**

Time of Collection = Time of Analysis for Analyze Immediately parameters

**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

MQ 6  
Prepared 5/14/09 1130**REAGENT WATER W/O ACID FOR LAND'OR  
LAKE LAND'OR WWTP PROJECT**Company Address: Olver Incorporated  
1116 S. Main Street  
Blacksburg, VA 24060

Phone #: 540-552-5548

Collection Date: 5/14/09

Collection Time: 00:00

PWS I.D. :

Entry Pt #:

Sample ID : AC21108

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	5/20/09	1	EPA 200.8
Zinc	N.D.	ug/L	5/20/09	1	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Nutz*

Date: 5/20/09

An Aqua America Company

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**REAGENT WATER W ACID FOR LAND'OR  
LAKE LAND'OR WWTP PROJECT****Company Address:** Aqua Pennsylvania, Inc.  
1116 S. Main Street  
Blacksburg, VA 24060  
**Phone #:** 540-552-5548**Collection Date:** 5/14/09  
**Collection Time:** 00:00  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC21109

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper	N.D.	ug/L	5/20/09	1	EPA 200.8
Zinc	N.D.	ug/L	5/20/09	1	EPA 200.8

N. D. = Not Detected

Approved By:

*Chalo D. Hutz*

Date: 5/20/09

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**APPENDIX C**

**MONITORING EVENTS LABORATORY REPORTS**



**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**TRIP BLANK #1**  
**LAKE LAND OR WWTP****Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868**Collection Date:** 5/26/09  
**Collection Time:** 12:00  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC22393

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper	N.D.	ug/L	5/29/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	5/29/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles P. Hurty*

Date: 6/2/09

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**FB-DISSOLVED #1**  
**LAKE LAND OR WWTP**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 5/27/09  
Collection Time: 11:14  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC22394

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper_Dissolved	N.D.	ug/L	5/29/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	5/29/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. Duty Date: 6/2/09

An Aqua America Company

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**FB-TOTAL #1**  
**LAKE LAND OR WWTP**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 5/27/09  
Collection Time: 11:16  
PWS I.D. :  
Entry Pt. # :  
Sample ID : AC22395

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	5/29/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	5/29/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Charles D. Hutz

Date: 6/2/09

An Aqua America Company

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**001 DISSOLVED #1  
LAKE LAND OR WWTP**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 5/27/09  
Collection Time: 11:18  
PWS I.D :  
Entry Pt. #:  
Sample ID : AC22396

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	2.7	ug/L	5/29/09	1.0	EPA 200.8
Zinc_Dissolved	33	ug/L	5/29/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 6/2/09

An Aqua America Company

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

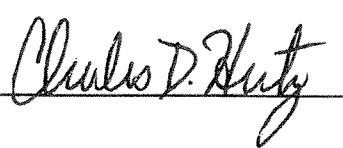
www.aquapennsylvania.com

**001 TOTAL #1  
LAKE LAND OR WWTP**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 5/27/09  
Collection Time: 11:20  
PWS I.D. :  
Entry Pt. # :  
Sample ID : AC22397

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	2.8	ug/L	5/29/09	1.0	EPA 200.8
Zinc	31	ug/L	5/29/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 6/2/09

An Aqua America Company

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**HARDNESS #1**  
**LAKE LAND OR WWTP**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 5/27/09  
Collection Time: 11:30  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC22398

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	INORGANIC_COMPOUNDS				
Hardness	156	mg/L	5/29/09	10	SM 2340C

N. D. = Not Detected

Approved By: Charles D. Hasty Date: 6/2/09

An Aqua America Company

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**Pennsylvania, Inc.**  
Lancaster Ave.  
1 Mawr, PA 19010-3489  
525-1400 AVA SW

## **Chain of Custody Record Samples for Laboratory Analysis**

Page 1 of 1

ple Submitted By.: Chris Wise

Compliance forms needed? YES  NO

Company Name.....: AQUA VAOLVER INC

### Sample Matrix water

sion Name.....:

### wastewater

ress.....

ne #:

S ID:

Distinguished By: (signature)

**Date/Time**

Received By: (signature)

### Date/Time

### **Comments**

---

**Special Instructions**

ie of Collection = Time of Analysis for Analyze Immediately parameters

cocles D

**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**AQUA PA MILLIQ WATER,MQ #20 W/O ACID  
LAKE LAND OR WWTP**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 5/21/09  
Collection Time: 10:30  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC22399

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	5/29/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	5/29/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. Nutz Date: 6/2/09

An Aqua America Company

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**AQUA PA MILLIQ WATER,MQ #21 ACID  
LAKE LAND OR WWTP**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146

Phone #: 804-749-8868

Collection Date: 5/21/09  
Collection Time: 10:30  
PWS I.D :  
Entry Pt. #:  
Sample ID : AC22400

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	5/29/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	5/29/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Hutz*

Date: 6/2/09

An Aqua America Company

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**AQUA PA MILLIQ WATER,H#1  
LAKE LAND OR WWTP****Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868**Collection Date:** 5/21/09  
**Collection Time:** 10:30  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC22401

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> INORGANIC_COMPOUNDS					
Hardness	N.D.	mg/L	5/29/09	10	SM 2340C

N. D. = Not Detected

Approved By: Chad D. Nutt Date: 6/2/09

An Aqua America Company

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**TRIP BLANK #2**  
**LAKE LAND'OR WWTP PROJECT****Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868**Collection Date:** 6/5/09  
**Collection Time:** 00:00  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC24079

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	6/16/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	6/16/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Hiltz*Date: 6/16/09

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**AQUA.**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**FB. DISSOLVED #2  
LAKE LAND'OR WWTP PROJECT****Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868**Collection Date:** 6/5/09  
**Collection Time:** 11:30  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC24080

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	N.D.	ug/L	6/16/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	6/16/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. Nutt Date: 6/16/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**FB. TOTAL #2**  
**LAKE LAND'OR WWTP PROJECT**

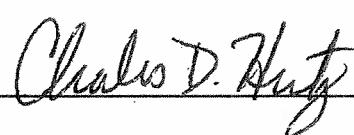
**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 6/5/09  
**Collection Time:** 11:25  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC24081

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	6/16/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	6/16/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 6/16/09

An Aqua America Company

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**Laboratory Report****AQUA.**

Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

---

**001 TOTAL #2**  
**LAKE LAND'OR WWTP PROJECT**

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 6/5/09

Collection Time: 11:40

PWS I.D.:

Entry Pt. #:

Sample ID : AC24082

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	1.9	ug/L	6/16/09	1.0	EPA 200.8
Zinc	24	ug/L	6/16/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. Hutz

Date: 6/16/09

An Aqua America Company

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**001 DISSOLVED #2  
LAKE LAND'OR WWTP PROJECT**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146

Phone # : 804-749-8868

Collection Date: 6/5/09  
Collection Time: 11:35  
PWS I.D.:  
Entry Pt.#:  
Sample ID : AC24083

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	1.5	ug/L	6/16/09	1.0	EPA 200.8
Zinc_Dissolved	22	ug/L	6/16/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Hutz*Date: 6/16/09

An Aqua America Company

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**HARDNESS #2**

Company Address: Aqua Virginia, Inc.

Collection Date: 6/5/09

Collection Time: 11:50

Phone # :

PWS I.D.:

Entry Pt. # :

Sample ID : AC24084

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: INORGANIC_COMPOUNDS</b>					
Hardness	145	mg/L	6/11/09	10	SM 2340C

N. D. = Not Detected

Approved By:

Date: 6/16/09

An Aqua America Company

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Aqua Pennsylvania, Inc.  
762 Lancaster Ave.  
Bryn Mawr, PA 19010-3489  
610-525-1400

**Chain of Custody Record**  
Samples for Laboratory Analysis

Page 1 of 1

Sample Submitted By: Chris Wise

Company Name.....: Aqua Pennsylvania Inc.

Division Name.....:

Address.....:

Phone #: 804-347-3638

PWS ID:

LAB USE  
ONLY!

Compliance forms needed: YES

NO

Sample Matrix water

Wastewater

Other:

CONDITIONS UPON RECEIPT: (Check One)

ICED  Ambient or  °C At Receipt

Sample Point	Sample Identification	LIMS #	Sample Collection Location	Date Collected	Time Collected	Sample Preservative	Analysis Requested
	Trip Blank # 2	A-1401	6/5/09	-	CW	HNO3	Total Cu & Zn
	FB: Dissolved # 2	ACD100	1/130	11/30	CW	HNO3	Dissolved Cu & Zn
	FB: Total # 2	ACD105	1/125	11/25	CW	HNO3	Total Cu & Zn
001	Total # 2	ACD102		1/40	CW	HNO3	Total Cu & Zn
001	Dissolved # 2	ACD103	1/35	11/35	CW	HNO3	Dissolved Cu & Zn
	Hardness # 2	ACD104	1/50	11/50	CW	NONC	Hardness

Relinquished By: (signature)

Date/time:

Received By: (signature)

Date/time:

Comments:

*Chris Wise*

6/5/09 1430

*Chris Wise*

Special Instructions

Time of Collection = Time of Analysis for Analyze Immediately parameters

**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**TRIP BLANK #3  
LAKE LAND'OR WWTP PROJECT**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 6/11/09  
**Collection Time:** 00:00  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC24643

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	6/16/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	6/16/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Hutz*

Date: 6/16/09

An Aqua America Company

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

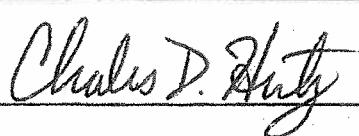
www.aquapennsylvania.com

**FB-DISSOLVED #3  
LAKE LAND'OR WWTP PROJECT****Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146**Phone # :** 804-749-8868**Collection Date:** 6/11/09  
**Collection Time:** 11:45  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC24644

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	N.D.	ug/L	6/16/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	6/16/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 6/16/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**FB-TOTAL #3**  
**LAKE LAND'OR WWTP PROJECT**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 6/11/09  
**Collection Time:** 11:40  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC24645

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	6/16/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	6/16/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. NutzDate: 6/16/09

An Aqua America Company

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**001 DISSOLVED #3  
LAKE LAND'OR WWTP PROJECT**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 6/11/09  
**Collection Time:** 11:50  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC24646

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	2.5	ug/L	6/16/09	1.0	EPA 200.8
Zinc_Dissolved	30	ug/L	6/16/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Hutz*

Date: 6/16/09

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**AQUA.**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**001 TOTAL #3  
LAKE LAND'OR WWTP PROJECT**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 6/11/09  
**Collection Time:** 11:53  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC24647

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	2.7	ug/L	6/16/09	1.0	EPA 200.8
Zinc	29	ug/L	6/16/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. HargyDate: 6/16/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**HARDNESS #3**

Company Address: Aqua Virginia, Inc.

Collection Date: 6/11/09

Collection Time: 11:55

Phone # :

PWS I.D.:

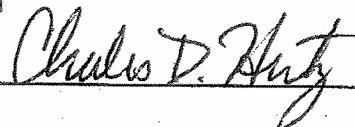
Entry Pt. #:

Sample ID : AC24648

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: INORGANIC_COMPOUNDS</b>					
Hardness	147	mg/L	6/15/09	10	SM 2340C

N. D. = Not Detected

Approved By:



Date: 6/16/09

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Aqua Pennsylvania, Inc.  
762 Lancaster Ave.  
Bryn Mawr, PA 19010-3489  
610-525-1400

Chain of Custody Record  
Samples for Laboratory Analysis

Page 1 of 1

Sample Submitted By: Chris Wise

Company Name.....: Aqua Pennsylvania Inc.

Division Name.....:

Address.....:

Phone #:

PWS ID:

LAB USE ONLY	LIMS #
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Sample Point #	Sample Identification	Sample Collection Information	Sample Preservation	Analysis Requested
	Trip Blank # 3	AC 24673 6/11/09	CH 6/11/09	HNO3 Total Cu + Zn
	FB-Dissolved # 3	AC 24670 6/11/09	CH 6/11/09	HNO3 Dissolved Cu & Zn
	FB - Total # 3	AC 24645 6/11/09	CH 6/11/09	HNO3 Total Cu & Zn
	OOL Dissolved # 3	AC 24646 6/11/09	CH 6/11/09	HNO3 Dissolved Cu & Zn
	OOL Total # 3	AC 24647 6/11/09	CH 6/11/09	HNO3 Total Cu & Zn
	OOL Total # 3	AC 24648 6/11/09	CH 6/11/09	HNO3 Total Cu & Zn
	Hardness # 3	AC 24649 6/11/09	CH 6/11/09	None Total Hardness

Received By: (Signature) John Evans  
Date/Time: 6/11/09 13:30

Received By: (Signature) John Evans  
Date/Time: 6/11/09 13:30

Comments: 10:05 am

Special Instructions

Time of Collection = Time of Analysis for Analyze Immediately parameters

Compliance forms needed: YES  NO

wastewater

other:

CONDITIONS UPON RECEIPT: ( Check One )	
<input type="checkbox"/> ICED	Ambient or <input checked="" type="checkbox"/> °C At Receipt

**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

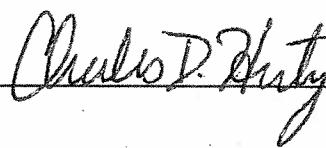
www.aquapennsylvania.com

**TRIP BLANK #4**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 6/17/09  
Collection Time: 00:00  
PWS I.D. :  
Entry Pt. # :  
Sample ID : AC25666

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	METALS				
Copper	N.D.	ug/L	6/24/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	6/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

  
Date: 6/29/09

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

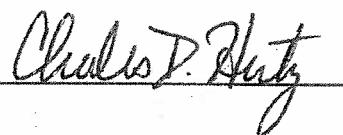
www.aquapennsylvania.com

**FB TOTAL #4**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 6/17/09  
Collection Time: 10:20  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC25667

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	METALS				
Copper	N.D.	ug/L	6/24/09	1.0	EPA 200.8
Zinc	1.3	ug/L	6/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

  
Date: 6/29/09

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**FB DISSOLVED #4**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 6/17/09  
Collection Time: 10:25  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC25668

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	METALS				
Copper_Dissolved	N.D.	ug/L	6/24/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	6/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Shultz*

Date: 6/29/09

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# Laboratory Report

**AQUA**Aqua Pennsylvania, Inc.  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**001 TOTAL #4**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 6/17/09  
Collection Time: 10:35  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC25669

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	5.9	ug/L	6/24/09	1.0	EPA 200.8
Zinc	62	ug/L	6/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 6/29/09

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# Laboratory Report

**AQUA**

Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

[www.aquapennsylvania.com](http://www.aquapennsylvania.com)

## 001 DISSOLVED #4

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 6/17/09  
Collection Time: 10:30  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC25670

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	METALS				
Copper_Dissolved	5.2	ug/L	6/24/09	1.0	EPA 200.8
Zinc_Dissolved	60	ug/L	6/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 6/29/09

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# Laboratory Report

**AQUA**Aqua Pennsylvania, Inc  
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Bryn Mawr, PA 19010

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## HARDNESS

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 6/17/09  
Collection Time: 10:36  
PWS I.D. :  
Entry Pt. # :  
Sample ID : AC25671

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Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	INORGANIC_COMPOUNDS				
Hardness	124	mg/L	6/22/09	10	SM 2340C

---

N. D. = Not Detected

Approved By: Charles D. Hiltz Date: 6/29/09

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## Chain of Custody Record Samples for Laboratory Analysis

610-525-1400

Sample Submitted By: Chris Wise  
Company Name.....: Aava Mousse Inc  
Division Name.....:  
Address.....:

Sample Submitted By: Chris Wise

Company Name

Division VI

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THE BIBLIOGRAPHY

Phone #:

PWS ID:

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Glossary

Blanc # 4

T.D. 074 44

H # 92110331.3 -

60104 #4

DOI [Dissolve](#) #4

### Hardness

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Received By (signature)

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Special Instructions

Time of Collection = Time of Analysis for Analyze /immediately parameters

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**TRIP BLANK #5**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 6/24/09  
Collection Time: 00:00  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC26318

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group: METALS					
Copper	N.D.	ug/L	6/26/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	6/26/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Ratty*Date: 6/29/09

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
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**FB TOTAL #5**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 6/24/09  
Collection Time: 12:15  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC26319

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper	N.D.	ug/L	6/26/09	1.0	EPA 200.8
Zinc	2.5	ug/L	6/26/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 6/29/09

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
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**FB DISSOLVED #5**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 6/24/09  
Collection Time: 12:20  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC26320

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	METALS				
Copper_Dissolved	N.D.	ug/L	6/26/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	6/26/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 6/29/09

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**001 DISSOLVED #5**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 6/24/09  
Collection Time: 12:25  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC26321

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	METALS				
Copper_Dissolved	4.6	ug/L	6/26/09	1.0	EPA 200.8
Zinc_Dissolved	57	ug/L	6/26/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. Ratty Date: 6/29/09

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# Laboratory Report

**AQUA**

Aqua Pennsylvania, Inc  
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---

**001 TOTAL #5**

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 6/24/09  
Collection Time: 12:29  
PWS I.D :  
Entry Pt. #:  
Sample ID : AC26322

---

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group: METALS					
Copper	4.9	ug/L	6/26/09	1.0	EPA 200.8
Zinc	57	ug/L	6/26/09	1.0	EPA 200.8

---

N. D. = Not Detected

Approved By:

Date: 6/29/09

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# Laboratory Report

**AQUA**

Aqua Pennsylvania, Inc.  
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Bryn Mawr, PA 19010

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## HARDNESS #5

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 6/24/09  
Collection Time: 12:30  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC26323

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group: INORGANIC_COMPOUNDS					
Hardness	112	mg/L	6/26/09	10	SM 2340C

N. D. = Not Detected

Approved By:



Date: 6/29/09

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**AQUA.**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**TRIP BLANK #6  
LAKE LAND'OR WWTP PROJECT**

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 7/6/09  
Collection Time: 00:00  
PWS I.D. :  
Entry Pt. # :  
Sample ID : AC27703

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	7/9/09	1.0	EPA 200.8
Zinc	1.1	ug/L	7/9/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 7/10/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

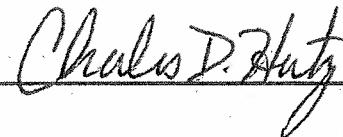
www.aquapennsylvania.com

**F.B.-TOTAL #6**  
**LAKE LAND'OR WWTP PROJECT**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 7/6/09  
Collection Time: 11:00  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC27704

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	7/9/09	1.0	EPA 200.8
Zinc	5.8	ug/L	7/9/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 7/10/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
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**F.B.-DISSOLVED #6  
LAKE LAND'OR WWTP PROJECT**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 7/6/09  
Collection Time: 11:04  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC27705

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group: METALS					
Copper_Dissolved	N.D.	ug/L	7/9/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	7/9/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. Hutz

Date: 7/10/09

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**001 DISSOLVED #6  
LAKE LAND'OR WWTP PROJECT**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 7/6/09  
Collection Time: 11:09  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC27706

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	3.6	ug/L	7/9/09	1.0	EPA 200.8
Zinc_Dissolved	58	ug/L	7/9/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 7/10/09

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**001 TOTAL #6  
LAKE LAND'OR WWTP PROJECT**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 7/6/09  
Collection Time: 11:13  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC27707

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	3.9	ug/L	7/9/09	1.0	EPA 200.8
Zinc	65	ug/L	7/9/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. HayzDate: 7/10/09

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**AQUA**Aqua Pennsylvania, Inc  
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Bryn Mawr, PA 19010

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**HARDNESS**  
**LAKE LAND'OR WWTP PROJECT**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 7/6/09  
Collection Time: 11:15  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC27708

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: INORGANIC_COMPOUNDS</b>					
Hardness	111	mg/L	7/8/09	10	SM 2340C

N. D. = Not Detected

Approved By: Charles D. HartyDate: 7/10/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
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**TRIP BLANK #  
LAKE LAND'OR WWTP PROJECT TRIP BLANK #7****Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868**Collection Date:** 7/17/09  
**Collection Time:** 00:00  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC29514

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	7/21/09	1.0	EPA 200.8
Zinc	1.0	ug/L	7/21/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles J. Duty*Date: 7/23/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**FB TOTAL #7****LAKE LAND'OR WWTP PROJECT FB TOTAL #7**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone # :** 804-749-8868

**Collection Date:** 7/17/09**Collection Time:** 12:10**PWS I.D.:****Entry Pt. #:****Sample ID :** AC29515

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	7/21/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	7/21/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 7/23/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**FB DISSOLVED #7****LAKE LAND'OR WWTP PROJECT FB DISSOLVED #7**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone # :** 804-749-8868

**Collection Date:** 7/17/09  
**Collection Time:** 12:15  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC29516

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	N.D.	ug/L	7/21/09	1.0	EPA 200.8
Zinc_Dissolved	12	ug/L	7/21/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 7/23/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**001 DISSOLVED #7****LAKE LAND'OR WWTP PROJECT 001 DISSOLVED #7**

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 7/17/09  
Collection Time: 12:20  
PWS I.D.:

Entry Pt. #:  
Sample ID : AC29517

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	3.3	ug/L	7/21/09	1.0	EPA 200.8
Zinc_Dissolved	51	ug/L	7/21/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles P. HartyDate: 7/23/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**001 TOTAL #7****LAKE LAND'OR WWTP PROJECT 000 TOTAL #7**

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 7/17/09  
Collection Time: 12:23  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC29518

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	4.2	ug/L	7/21/09	1.0	EPA 200.8
Zinc	56	ug/L	7/21/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. HutzDate: 7/23/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**HARDNESS****LAKE LAND'OR WWTP PROJECT HARDNESS**

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone # : 804-749-8868

Collection Date: 7/17/09

Collection Time: 12:30

PWS I.D. :

Entry Pt. # :

Sample ID : AC29519

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: INORGANIC_COMPOUNDS</b>					
Hardness	120	mg/L	7/22/09	10	SM 2340C

N. D. = Not Detected

Approved By:

*Charles P. Harty*Date: 7/23/09

An Aqua America Company

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Aqua Pennsylvania, Inc.  
762 Lancaster Ave.  
Bryn Mawr, PA 19010-3489  
610-525-1400

## **Chain of Custody Record Samples for Laboratory Analysis**

Page 1 of 1

Sample Submitted By:	Chris Wise				
Company Name.....:	Aqua VA Loyer Inc.				
Division Name.....:					
Address.....:					
Phone #:					
PWS ID:					
LAB USE ONLY!!					
Sample Point#	Sample Identification	LIMS #	Sample Collection Information Date / Time Collected	Sample Preservation	Analysis Requested
	Trip Blank #7	AC 2454	7/17/09 12:10	CW	Total Cu + Zn
	FB Total #7	AC 2951		CW	Total Cu + Zn
	FB Dissolved #7	AC 2951	12:15	CW	Dissolved Cu + Zn
	DO Dissolved #7	AC 2951	12:20	CW	Dissolved Cu + Zn
	DO Total #7	AC 2951	12:23	CW	Total Cu + Zn
	Hardness	AC 2454	7/17/09 12:30	CW	NaOH Total Hardness
					↓ ? ↓
					No indication that the pH was high
					No preservative added when sample kit was prepared (RTH)
Relinquished By (Signature):	<i>Chris Wise</i>	Date/Time:	7/17/09 13:00	Comments:	7-22-09 10:50

### **Special Instructions**

**Time of Collection = Time of Analysis for Analyze Immediately parameters**

**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**TRIP BLANK #8**  
**LAKE LAND'OR WWTP PROJECT**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 7/22/09  
Collection Time: 00:00  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC30214

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper	N.D.	ug/L	7/24/09	1.0	EPA 200.8
Zinc	1.1	ug/L	7/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Rhy*

Date: 7/28/09

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**FB TOTAL #8****LAKE LAND'OR WWTP PROJECT**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 7/22/09  
Collection Time: 14:05  
FWS I.D. :  
Entry Pt. #:  
Sample ID : AC30215

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	7/24/09	1.0	EPA 200.8
Zinc	3.1	ug/L	7/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 7/28/09

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**Laboratory Report****AQUA**

Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**FB DISSOLVED #8****LAKE LAND'OR WWTP PROJECT**

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 7/22/09  
Collection Time: 14:10  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC30216

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	N.D.	ug/L	7/24/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	7/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

*Charles D. Hutz*

Date: 7/28/09

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**001 DISSOLVED #8****LAKE LAND'OR WWTP PROJECT**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 7/22/09  
Collection Time: 14:15  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC30217

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper_Dissolved	4.0	ug/L	7/24/09	1.0	EPA 200.8
Zinc_Dissolved	59	ug/L	7/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 7/28/09

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**001 TOTAL #8****LAKE LAND'OR WWTP PROJECT**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 7/22/09  
Collection Time: 14:18  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC30218

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper	4.4	ug/L	7/24/09	1.0	EPA 200.8
Zinc	60	ug/L	7/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 7/28/09

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**Laboratory Report****AQUA**

Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**HARDNESS**  
**LAKE LAND'OR WWTP PROJECT**

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 7/22/09  
Collection Time: 14:20  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC30219

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: CATIONS</b>					
Sodium	78	mg/L	7/27/09	2.5	ASTM D6919-03
Potassium	14	mg/L	7/27/09	4.0	ASTM D6919-03
Magnesium	6.6	mg/L	7/27/09	2.0	ASTM D6919-03
Calcium	42	mg/L	7/27/09	2.0	ASTM D6919-03
Lithium	N.D.	mg/L	7/27/09	0.25	ASTM D6919-03
<b>Analysis Group: INORGANIC_COMPOUNDS</b>					
Hardness	129	mg/L	7/27/09	10	SM 2340C

N. D. = Not Detected

Approved By:

*Charles D. Blatz*

Date: 7/28/09

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Aqua Pennsylvania, Inc.  
762 Lancaster Ave.  
Bryn Mawr, PA 19010-3489  
610-525-1400

Chain of Custody Record  
Samples for Laboratory Analysis

Page 1 of 1

Sample Submitted By.: Chris Wise

Company Name.....: Aqua VA Cover Inc

Division Name.....:

Address.....:

Phone #:  
PWS ID:

LAB USE  
ONLY!!

Sample Point #	Sample Identification	LIMS #	Sample Collection Information	Sample Preservation	Analysis Requested
TRIP BLANK #8	AC-30214	7/22/09	CH	H2O3	Total Cu & Zn
FB Total #8	AC-30214		14:08		Total Cu & Zn
FB Dissolved #8	AC-30214		14:10		Dissolved Cu & Zn
OOL Dissolved #8	AC-30217		14:15		Dissolved Cu & Zn
OOL Total #8	AC-30217		14:18		Total Cu & Zn
Hardness	AC-30219	7/22/09	14:20	CH (NaOH)	Total Hardness
					Hardness sample was not preserved with NaOH
					pH was neutral
					CDA 7/28/09
Requested By (signature)	Date/Time	Received By (signature)	Date/Time	Comments	
	7/22/09 1500		7/23/09	10:10 AM	

Special Instructions

Time of Collection = Time of Analysis for Analyze Immediately parameters Coder K

**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**TRIP BLANK #9**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 8/21/09  
**Collection Time:** 00:00  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC34296

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	8/27/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	8/27/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 8/31/09

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# Laboratory Report

**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**FB TOTAL #9**

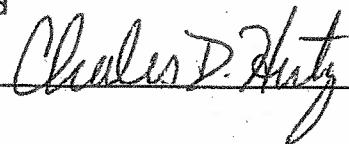
**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 8/21/09  
**Collection Time:** 11:34  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC34297

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	8/27/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	8/27/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 8/31/09

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Bryn Mawr, PA 19010

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**FB DISSOLVED #9**

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 8/21/09  
Collection Time: 11:38  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC34298

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	N.D.	ug/L	8/27/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	8/27/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. ShultzDate: 8/31/09

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**AQUA**Aqua Pennsylvania, Inc  
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Bryn Mawr, PA 19010

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**001 DISSOLVED #9**

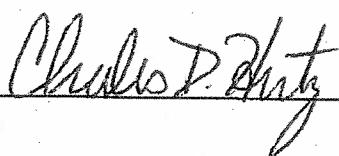
**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 8/21/09  
**Collection Time:** 11:44  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC34299

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	3.4	ug/L	8/27/09	1.0	EPA 200.8
Zinc_Dissolved	41	ug/L	8/27/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 8/31/09

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762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**001 TOTAL #9**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 8/21/09  
**Collection Time:** 11:47  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC34300

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	4.9	ug/L	8/27/09	1.0	EPA 200.8
Zinc	50	ug/L	8/27/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 8/31/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**HARDNESS**

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 8/21/09  
Collection Time: 11:49  
PWS I.D. :  
Entry Pt. # :  
Sample ID : AC34301

---

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: INORGANIC_COMPOUNDS</b>					
Hardness	80	mg/L	8/25/09	10	SM 2340C

---

N. D. = Not Detected

Approved By:

*Charles D. Harty*Date: 8/31/09

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Aqua Pennsylvania, Inc.  
762 Lancaster Ave.  
Bryn Mawr, PA 19010-3489  
610-525-1400

**Chain of Custody Record**  
Samples for Laboratory Analysis

Page 1 of 1

Sample Submitted By: Chris Wisse

Company Name.....: Aqua Unilover Inc.

Division Name.....:

Address.....:

Phone #:  
PWS ID:

LAB USE  
ONLY!!

LIMS  
#

CONDITIONS UPON RECEIPT : ( Check One )  
 ICED  Ambient or  °C At Receipt

Sample Point #

Sample Identification

Sample Collection Information  
Date Time Collected by

Preservation

Analysis Requested

Cu, HNO<sub>3</sub>

Total Cu & Zn

Dissolved Cu & Zn

Dissolved Cu & Zn

Total Cu & Zn

NaOH \* Total Hardness

HNO<sub>3</sub> added when sample

Kit was prepared KWT

Requisitioned By (Signature)

Date/Time

Received By (Signature)

Date/Time

Comments

Chris Wisse	8/21/09 12:30	Karen Stewart	9/24/09 10:30 AM
-------------	---------------	---------------	------------------

**Special Instructions**

Time of Collection = Time of Analysis for Analysis Immediately parameters

\* Label on bottle indicated that hardness sample acidified with concentrated HNO<sub>3</sub>

8/31/09 CDH

**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**TRIP BLANK #10**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 9/2/09  
Collection Time: 00:00  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC36047

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper	N.D.	ug/L	9/4/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	9/4/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. Rutz Date: 9/9/09

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# Laboratory Report

**AQUA**

Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

[www.aquapennsylvania.com](http://www.aquapennsylvania.com)

## FB TOTAL #10

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 9/2/09  
Collection Time: 13:35  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC36048

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	METALS				
Copper	N.D.	ug/L	9/4/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	9/4/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Charles D. Dwyer Date: 9/9/09

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# Laboratory Report

**AQUA**

Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

[www.aquapennsylvania.com](http://www.aquapennsylvania.com)

## FB DISSOLVED #10

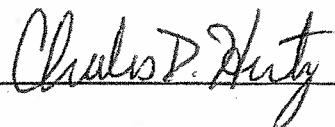
Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 9/2/09  
Collection Time: 13:40  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC36049

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper_Dissolved	N.D.	ug/L	9/4/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	9/4/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 9/9/09

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# Laboratory Report

**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**001 DISSOLVED #10**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 9/2/09  
Collection Time: 13:45  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC36050

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	4.0	ug/L	9/4/09	1.0	EPA 200.8
Zinc_Dissolved	37	ug/L	9/4/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By: Chad D. Blatz Date: 9/9/09

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
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**001 TOTAL #10**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 9/2/09  
Collection Time: 13:50  
PWS I.D.:  
Entry Pt. #:  
Sample ID : AC36051

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group:</b> METALS					
Copper	5.0	ug/L	9/4/09	1.0	EPA 200.8
Zinc	.52	ug/L	9/4/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 9/9/09

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**Laboratory Report****AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**HARDNESS #10**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 9/2/09  
Collection Time: 13:55  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC36052

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
Analysis Group:	INORGANIC_COMPOUNDS				
Hardness	130	mg/L	9/9/09	10	SM 2340C

N. D. = Not Detected

Approved By:

*Charles P. Shultz*

Date: 9/9/09

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Aqua Pennsylvania, Inc.  
762 Lancaster Ave.  
Bryn Mawr, PA 19010-3489  
310-525-1400

Chain of Custody Record  
Samples for Laboratory Analysis

Page 1 of 1

Lake Land Or WWT P

Sample Submitted By: Chris Wise  
Company Name:..... Aqua VA Lover Inc  
Division Name:.....  
Address:.....

Phone #:.....  
AWS ID:.....

Compliance forms needed: YES NO X  
Sample Matrix water  
wastewater  
other:

Sample Point #	Sample Identification	LIMS #	Sample Collection Information	Sample Preservation	Sample Analysis Requested
	TriP Blank #10	AC-36041	9/3/09 1	CH <sub>4</sub>	H <sub>2</sub> O <sub>3</sub> Total Cu & Zn
	FB Total #10	AC-36042	13:35		Total Cu & Zn
	FB Dissolved #10	AC-36043	13:40		Dissolved Cu & Zn
	OOI Dissolved #10	AC-36044	13:45		Dissolved Cu & Zn
	OOI Total #10	AC-36045	13:50		Total Cu & Zn
	Hardness #10	AC-36052	9/2/09 13:55	CH <sub>4</sub>	H <sub>2</sub> O <sub>3</sub> Total Hardness

CONDITIONS UPON RECEIPT : ( Check One )	
<input type="checkbox"/> ICED	<input type="checkbox"/> Ambient or °C At Receipt
<input type="checkbox"/>	
<input type="checkbox"/>	

Special Instructions	Received By (Signature)	Date/Time	Comments
	Karen Estam	9/3/09 14:30	10:05 AM

Time of Collection = Time of Analysis for Analyze Immediately parameters

**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**TRIP BLANK #11**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 9/16/09  
**Collection Time:** 00:00  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC37652

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	9/22/09	1.0	EPA 200.8
Zinc	1.1	ug/L	9/22/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 9/23/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**FB TOTAL #11**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 9/16/09  
**Collection Time:** 12:24  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC37653

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	9/22/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	9/22/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 9/23/09

An Aqua America Company

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**AQUA**Aqua Pennsylvania, Inc.  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**FB DISSOLVED #11**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 9/16/09  
**Collection Time:** 12:30  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC37654

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	N.D.	ug/L	9/22/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	9/22/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 9/23/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**001 DISSOLVED #11**Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868Collection Date: 9/16/09  
Collection Time: 12:34  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC37655

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	1.8	ug/L	9/22/09	1.0	EPA 200.8
Zinc_Dissolved	43	ug/L	9/22/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 9/23/09

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Bryn Mawr, PA 19010

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**001 TOTAL #11**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 9/16/09  
**Collection Time:** 12:38  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC37656

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	2.8	ug/L	9/22/09	1.0	EPA 200.8
Zinc	54	ug/L	9/22/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 9/23/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

www.aquapennsylvania.com

**HARDNESS #11**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 9/16/09  
**Collection Time:** 12:41  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC37657

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: INORGANIC_COMPOUNDS</b>					
Hardness	169	mg/L	9/18/09	10	SM 2340C

N. D. = Not Detected

Approved By:

Date: 9/23/09

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**AQUA**Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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**HARDNESS #11 SPARE**

**Company Address:** Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
**Phone #:** 804-749-8868

**Collection Date:** 9/16/09  
**Collection Time:** 12:45  
**PWS I.D.:**  
**Entry Pt. #:**  
**Sample ID :** AC37658

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: INORGANIC_COMPOUNDS</b>					
Hardness	179	mg/L	9/18/09	10	SM 2340C

N. D. = Not Detected

Approved By:

Date: 9/23/09

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qua Pennsylvania, Inc.  
52 Lancaster Ave.  
wyn Mawr, PA 19010-3489  
10-525-1000

## **Chain of Custody Record**

### Samples for Laboratory Analysis

Page 1 of 1

### Special Instructions

**Time of Collection = Time of Analysis for Analyze Immediately parameters**

# Laboratory Report

Page 1 of 1



Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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## TRIP BLANK #12

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146

Phone #: 804-749-8868

Collection Date: 9/22/09

Collection Time: 00:00

PWS I.D.:

Entry Pt. #:

Sample ID : AC38436

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	9/24/09	1.0	EPA 200.8
Zinc	1.0	ug/L	9/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 9/28/09

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Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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## FB TOTAL #12

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 9/22/09  
Collection Time: 13:45  
PWS I.D. :  
Entry Pt. #:  
Sample ID : AC38437

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	N.D.	ug/L	9/24/09	1.0	EPA 200.8
Zinc	N.D.	ug/L	9/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 9/28/09

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**AQUA**

Aqua Pennsylvania, Inc  
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Bryn Mawr, PA 19010

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## FB DISSOLVED #12

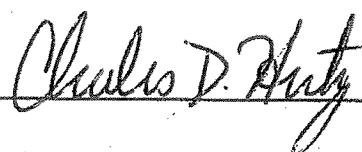
Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 9/22/09  
Collection Time: 13:50  
PWS I.D :  
Entry Pt. #:  
Sample ID : AC38438

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper_Dissolved	N.D.	ug/L	9/24/09	1.0	EPA 200.8
Zinc_Dissolved	N.D.	ug/L	9/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:



Date: 9/28/09

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# Laboratory Report

Page 1 of 1



Aqua Pennsylvania, Inc.  
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## 001 TOTAL #12

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 9/22/09  
Collection Time: 14:00  
PWS I.D :  
Entry Pt. #:  
Sample ID : AC38440

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: METALS</b>					
Copper	4.5	ug/L	9/24/09	1.0	EPA 200.8
Zinc	61	ug/L	9/24/09	1.0	EPA 200.8

N. D. = Not Detected

Approved By:

Date: 9/28/09

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**AQUA**

Aqua Pennsylvania, Inc  
762 W. Lancaster Avenue  
Bryn Mawr, PA 19010

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## HARDNESS #12

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 9/22/09  
Collection Time: 14:02  
PWS I.D :  
Entry Pt. #:  
Sample ID : AC38441

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: INORGANIC_COMPOUNDS</b>					
Hardness	130	mg/L	9/25/09	10	SM 2340C

N. D. = Not Detected

Approved By:

Date: 9/28/09

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Aqua Pennsylvania, Inc  
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Bryn Mawr, PA 19010

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## HARDNESS #12 EXTRA

Company Address: Aqua Virginia, Inc.  
2414 Granite Ridge Road  
Rockville, VA 23146  
Phone #: 804-749-8868

Collection Date: 9/22/09  
Collection Time: 14:03  
PWS I.D :  
Entry Pt. #:  
Sample ID : AC38442

Analyte Name	Result	Units	Analysis Date	Reporting Limit	Method Reference
<b>Analysis Group: INORGANIC_COMPOUNDS</b>					
Hardness	165	mg/L	9/24/09	10	SM 2340C

N. D. = Not Detected

Approved By:

Date: 9/28/09

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**APPENDIX D**  
**MSTRANTI PRINTOUT**



# FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: LandOr WWTP

Permit No.: VA0025020

Receiving Stream: South River, UT

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows				Mixing Information				Effluent Information			
Mean Hardness (as CaCO <sub>3</sub> ) =	mg/L	1Q10 (Annual) =	0 MGD	0 %	0 %	Mean Hardness (as CaCO <sub>3</sub> ) =	129 mg/L	deg C	129 mg/L	90% Temp (Annual) =	0 %	deg C	129 mg/L
90% Temperature (Annual) =	deg C	7Q10 (Annual) =	0 MGD	0 %	0 %	90% Temp (Wet season) =	15 deg C	SU	15 deg C	90% Temp (Wet season) =	0 %	SU	15 deg C
90% Temperature (Wet season) =	SU	3Q10 (Annual) =	0 MGD	0 %	0 %	90% Maximum pH =	7.5 SU	SU	7.5 SU	90% Maximum pH =	0 %	SU	7.5 SU
90% Maximum pH =	SU	1Q10 (Wet season) =	0 MGD	0 %	0 %	10% Maximum pH =	0.22 MGD		0.22 MGD	10% Maximum pH =	0 %		0.22 MGD
10% Maximum pH =		3Q10 (Wet season) =	0 MGD	0 %	0 %	Discharge Flow =				Discharge Flow =			
Tier Designation (1 or 2) =	1	3Q05 =	0 MGD	0 %	0 %								
Public Water Supply (PWS) Y/N? =	n	Harmonic Mean =	0 MGD	0 %	0 %								
Trot Present Y/N? =	n	Annual Average =	0 MGD	0 %	0 %								
Early Life Stages Present Y/N? =	y												

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Most Limiting Allocations				
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Aceanaphene	0	--	--	na	2.7E+03	--	--	na	2.7E+03	--	--	--	--	--	--	2.7E+03	--	
Acrolein	0	--	--	na	7.8E+02	--	--	na	7.8E+02	--	--	--	--	--	--	7.8E+02	--	
Acrylonitrile <sup>c</sup>	0	--	--	na	6.6E+00	--	--	na	6.6E+00	--	--	--	--	--	--	6.6E+00	--	
Aldrin <sup>c</sup>	0	3.0E+00	--	na	1.4E-03	3.0E+00	--	na	1.4E-03	--	--	--	--	--	--	1.4E-03	--	
Ammonia-N (mg/l) (Yearly)	0.044508	1.99E+01	4.36E+00	na	--	2.0E+01	4.4E+00	na	--	--	--	--	--	--	--	2.0E+01	4.4E+00	na
Ammonia-N (mg/l) (High Flow)	0.044508	1.99E+01	4.23E+00	na	--	2.0E+01	4.2E+00	na	--	--	--	--	--	--	--	2.0E+01	4.2E+00	na
Anthracene	0	--	--	na	1.1E+05	--	--	na	1.1E+05	--	--	--	--	--	--	1.1E+05	--	
Antimony	0	--	--	na	4.3E+03	--	--	na	4.3E+03	--	--	--	--	--	--	4.3E+03	--	
Arsenic	0.64	3.4E+02	1.5E+02	na	--	3.4E+02	1.5E+02	na	--	--	--	--	--	--	--	3.4E+02	1.5E+02	na
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	
Benzene <sup>c</sup>	0	--	--	na	7.1E+02	--	--	na	7.1E+02	--	--	--	--	--	--	7.1E+02	--	
Benzidine <sup>c</sup>	0	--	--	na	5.4E-03	--	--	na	5.4E-03	--	--	--	--	--	--	5.4E-03	--	
Benzo (a) anthracene <sup>c</sup>	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	4.9E-01	--	
Benzo (b) fluoranthene <sup>c</sup>	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	4.9E-01	--	
Benzo (k) fluoranthene <sup>c</sup>	0	--	--	na	3.6E+03	--	--	na	3.6E+03	--	--	--	--	--	--	3.6E+03	--	
Benzo (a) pyrene <sup>c</sup>	0	--	--	na	5.2E+03	--	--	na	5.2E+03	--	--	--	--	--	--	5.2E+03	--	
Bis(2-Chloroethyl) Ether	0	--	--	na	1.4E-01	--	--	na	1.4E-01	--	--	--	--	--	--	1.4E-01	--	
Bis(2-Chloroisopropyl) Ether	0	--	--	na	1.7E+05	--	--	na	1.7E+05	--	--	--	--	--	--	1.7E+05	--	
Bromform <sup>c</sup>	0	--	--	na	3.6E+03	--	--	na	3.6E+03	--	--	--	--	--	--	3.6E+03	--	
Butylbenzylphthalate	0	--	--	na	5.2E+03	--	--	na	5.2E+03	--	--	--	--	--	--	5.2E+03	--	
Cadmium	0.26	5.2E+00	1.4E+00	na	--	5.2E+00	1.4E+00	na	--	--	--	--	--	--	--	5.2E+00	1.4E+00	na
Carbon Tetrachloride <sup>c</sup>	0	--	--	na	4.4E+01	--	--	na	4.4E+01	--	--	--	--	--	--	4.4E+01	--	
Chlordane <sup>c</sup>	0	2.4E+00	4.3E-03	na	2.2E-02	2.4E+00	4.3E-03	na	2.2E-02	--	--	--	--	--	--	2.2E-02	--	
Chloride	47952.27	8.6E+05	2.3E-05	na	--	8.6E+05	2.3E+05	na	--	--	--	--	--	--	--	8.6E+05	2.3E+05	na
TRC	0	1.9E+01	1.1E+01	na	--	1.9E+01	1.1E+01	na	--	--	--	--	--	--	--	1.9E+01	1.1E+01	na
Chlorobenzene	0	--	--	na	2.1E+04	--	--	na	2.1E+04	--	--	--	--	--	--	2.1E+04	--	

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations				
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Chlorodibromomethane <sup>c</sup>	0	--	--	na	3.4E+02	--	--	na	3.4E+02	--	--	--	--	--	--	--	3.4E+02	
Chloroform <sup>c</sup>	0	--	--	na	2.9E+04	--	--	na	2.9E+04	--	--	--	--	--	--	--	2.9E+04	
2-Chloronaphthalene	0	--	--	na	4.3E+03	--	--	na	4.3E+03	--	--	--	--	--	--	--	4.3E+03	
2-Chlorophenol	0	--	--	na	4.0E+02	--	--	na	4.0E+02	--	--	--	--	--	--	--	4.0E+02	
Chlорpyrifos	0	8.3E-02	4.1E-02	na	--	8.3E-02	4.1E-02	na	--	--	--	--	--	--	8.3E-02	4.1E-02	na	
Chromium III	0	7.0E+02	9.1E+01	na	--	7.0E+02	9.1E+01	na	--	--	--	--	--	--	7.0E+02	9.1E+01	na	
Chromium VI	0.29	1.6E+01	1.1E+01	na	--	1.6E+01	1.1E+01	na	--	--	--	--	--	--	1.6E+01	1.1E+01	na	
Chromium, Total	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	
Chrysene <sup>c</sup>	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	4.9E-01	
Copper	2.52	1.7E+01	1.1E+01	na	--	1.7E+01	1.1E+01	na	--	--	--	--	--	--	1.7E+01	1.1E+01	na	
Cyanide	0	2.2E+01	5.2E+00	na	2.2E+05	2.2E+01	5.2E+00	na	2.2E+05	--	--	--	--	--	--	2.2E+01	5.2E+00	na
DDD <sup>c</sup>	0	--	--	na	8.4E-03	--	--	na	8.4E-03	--	--	--	--	--	--	--	8.4E-03	
DDE <sup>c</sup>	0	--	--	na	5.9E-03	--	--	na	5.9E-03	--	--	--	--	--	--	--	5.9E-03	
DDT <sup>c</sup>	0	1.1E+00	1.0E-03	na	5.9E-03	1.1E+00	1.0E-03	na	5.9E-03	--	--	--	--	--	1.1E+00	1.0E-03	na	
Demeton	0	--	1.0E-01	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	1.0E-01	na	
Dibenz(a,h)anthracene <sup>c</sup>	0	--	--	na	4.9E-01	--	--	na	4.9E-01	--	--	--	--	--	--	--	4.9E-01	
Diethyl phthalate	0	--	--	na	1.2E+04	--	--	na	1.2E+04	--	--	--	--	--	--	--	1.2E+04	
Dichloromethane	(Methylene Chloride) <sup>c</sup>	0	--	--	na	1.6E-04	--	--	na	1.6E-04	--	--	--	--	--	--	1.6E-04	
1,2-Dichlorobenzene	0	--	--	na	1.7E-04	--	--	na	1.7E-04	--	--	--	--	--	--	--	1.7E-04	
1,3-Dichlorobenzene	0	--	--	na	2.6E-03	--	--	na	2.6E-03	--	--	--	--	--	--	--	2.6E-03	
1,4-Dichlorobenzene	0	--	--	na	2.6E-03	--	--	na	2.6E-03	--	--	--	--	--	--	--	2.6E-03	
3,3-Dichlorobenzidine <sup>c</sup>	0	--	--	na	7.7E-01	--	--	na	7.7E-01	--	--	--	--	--	--	--	7.7E-01	
Dichlorobromomethane	<sup>c</sup>	0	--	--	na	4.6E-02	--	--	na	4.6E-02	--	--	--	--	--	--	4.6E-02	
1,2-Dichloroethane <sup>c</sup>	0	--	--	na	9.9E-02	--	--	na	9.9E-02	--	--	--	--	--	--	--	9.9E-02	
1,1-Dichloroethylene	0	--	--	na	1.7E-04	--	--	na	1.7E-04	--	--	--	--	--	--	--	1.7E-04	
1,2-trans-dichloroethylene	0	--	--	na	1.4E-05	--	--	na	1.4E-05	--	--	--	--	--	--	--	1.4E-05	
2,4-Dichlorophenol	0	--	--	na	7.9E-02	--	--	na	7.9E-02	--	--	--	--	--	--	--	7.9E-02	
2,4-Dichlorophenoxyacetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	
1,2-Dichloropropane <sup>c</sup>	0	--	--	na	3.9E-02	--	--	na	3.9E-02	--	--	--	--	--	--	--	3.9E-02	
1,3-Dichloropropene	0	--	--	na	1.7E-03	--	--	na	1.7E-03	--	--	--	--	--	--	--	1.7E-03	
Diehdin <sup>c</sup>	0	2.4E-01	5.6E-02	na	1.4E-03	2.4E-01	5.6E-02	na	1.4E-03	--	--	--	--	--	2.4E-01	5.6E-02	na	
Diethyl Phthalate	0	--	--	na	1.2E+05	--	--	na	1.2E+05	--	--	--	--	--	--	--	1.2E+05	
Di-2-Ethylhexyl Phthalate <sup>c</sup>	0	--	--	na	5.9E+01	--	--	na	5.9E+01	--	--	--	--	--	--	--	5.9E+01	
2,4-Dimethylphenol	0	--	--	na	2.3E+03	--	--	na	2.3E+03	--	--	--	--	--	--	--	2.3E+03	
Dimethyl Phthalate	0	--	--	na	2.9E+06	--	--	na	2.9E+06	--	--	--	--	--	--	--	2.9E+06	
Di-n-Butyl Phthalate	0	--	--	na	1.2E+04	--	--	na	1.2E+04	--	--	--	--	--	--	--	1.2E+04	
2,4-Dinitrophenol	0	--	--	na	1.4E+04	--	--	na	1.4E+04	--	--	--	--	--	--	--	1.4E+04	
2-Methyl-4,6-Dinitrophenol	0	--	--	na	7.6E+02	--	--	na	7.6E+02	--	--	--	--	--	--	--	7.7E+02	
2,4-Dinitrotoluene <sup>c</sup>	0	--	--	na	9.1E+01	--	--	na	9.1E+01	--	--	--	--	--	--	--	9.1E+01	
Dioxin (2,3,7,8-tearachlorobiphenzo-p-dioxin) (ppd)	0	--	--	na	1.2E-06	--	--	na	1.2E-06	--	--	--	--	--	--	--	na	
1,2-Diphenylhydrazine <sup>c</sup>	0	--	--	na	5.4E+00	--	--	na	5.4E+00	--	--	--	--	--	--	--	5.4E+00	
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E-02	2.2E-01	5.6E-02	na	2.4E-02	--	--	--	--	--	2.2E-01	5.6E-02	na	
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E-02	2.2E-01	5.6E-02	na	2.4E-02	--	--	--	--	--	2.2E-01	5.6E-02	na	
Endosulfan Sulfate	0	8.6E-02	3.6E-02	na	8.1E-01	8.6E-02	3.6E-02	na	8.1E-01	--	--	--	--	--	8.6E-02	3.6E-02	na	
Endrin	0	--	--	na	8.1E-01	--	--	na	8.1E-01	--	--	--	--	--	--	--	8.1E-01	
Endrin Aldehyde	0	--	--	na	8.1E-01	--	--	na	8.1E-01	--	--	--	--	--	--	--	8.1E-01	

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Most Limiting Allocations				
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Ethylbenzene	0	-	-	na	2.9E+04	-	-	na	2.9E+04	-	-	na	-	-	-	2.9E+04	-	
Fluoranthene	0	-	-	na	3.1E+02	-	-	na	3.1E+02	-	-	na	-	-	-	3.1E+02	-	
Fluorine	0	-	-	na	1.4E+04	-	-	na	1.4E+04	-	-	na	-	-	-	1.4E+04	-	
Foaming Agents	0	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-	
Guthion	0	-	1.0E-02	na	-	-	-	na	1.0E-02	-	-	na	-	-	-	1.0E-02	na	
Heptachlor	0	5.2E-01	3.8E-03	na	2.1E-03	5.2E-01	3.8E-03	na	2.1E-03	-	-	na	-	-	-	5.2E-01	3.8E-03	na
Heptachlor Epoxide <sup>c</sup>	0	5.2E-01	3.8E-03	na	1.1E-03	5.2E-01	3.8E-03	na	1.1E-03	-	-	na	-	-	-	5.2E-01	3.8E-03	na
Hexachlorobenzene <sup>c</sup>	0	-	-	na	7.7E-03	-	-	na	7.7E-03	-	-	na	-	-	-	7.7E-03	na	-
Hexachlorobutadiene <sup>c</sup>	0	-	-	na	5.0E+02	-	-	na	5.0E+02	-	-	na	-	-	-	5.0E+02	na	-
Hexachlorocyclohexane	0	-	-	na	1.3E-01	-	-	na	1.3E-01	-	-	na	-	-	-	1.3E-01	na	-
Alpha-BHC <sup>c</sup>	0	-	-	na	4.6E-01	-	-	na	4.6E-01	-	-	na	-	-	-	4.6E-01	na	-
Hexachlorocyclohexane	0	-	-	na	1.7E+04	-	-	na	1.7E+04	-	-	na	-	-	-	1.7E+04	na	-
Beta-BHC <sup>c</sup>	0	-	-	na	8.9E+01	-	-	na	8.9E+01	-	-	na	-	-	-	8.9E+01	na	-
Hexachlorocyclohexane	0	-	-	na	2.0E+00	-	-	na	2.0E+00	-	-	na	-	-	-	2.0E+00	na	-
Gamma-BHC <sup>c</sup> (Lindane)	0	9.5E-01	na	na	6.3E-01	9.5E-01	-	na	6.3E-01	-	-	na	-	-	-	9.5E-01	na	6.3E-01
Hexachlorocyclopentadiene	0	-	-	na	8.9E+01	-	-	na	8.9E+01	-	-	na	-	-	-	8.9E+01	na	-
Hexachloroethane <sup>c</sup>	0	-	-	na	2.6E+04	-	-	na	2.6E+04	-	-	na	-	-	-	2.6E+04	na	-
Hydrogen Sulfide	0	-	-	na	4.9E-01	-	-	na	4.9E-01	-	-	na	-	-	-	4.9E-01	na	-
Indeno (1,2,3-cd) pyrene <sup>c</sup>	0	-	-	na	2.0E+00	-	-	na	2.0E+00	-	-	na	-	-	-	2.0E+00	na	-
Iron	0	-	-	na	4.9E-01	-	-	na	4.9E-01	-	-	na	-	-	-	4.9E-01	na	-
Isophorone <sup>c</sup>	0	-	-	na	2.6E+04	-	-	na	2.6E+04	-	-	na	-	-	-	2.6E+04	na	-
Kepone	0	-	0.0E+00	na	-	-	-	na	0.0E+00	-	-	na	-	-	-	0.0E+00	na	-
Lead	2.09	1.6E+02	1.9E+01	na	-	1.6E+02	1.9E+01	na	-	-	-	na	-	-	-	1.6E+02	1.9E+01	na
Malathion	0	-	1.0E-01	na	-	-	-	na	1.0E-01	-	-	na	-	-	-	1.0E-01	na	-
Manganese	0	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-	-
Mercury	0.081	1.4E+00	7.7E-01	na	5.1E-02	1.4E+00	7.7E-01	na	5.1E-02	-	-	na	-	-	-	5.1E-02	7.7E-01	na
Methyl Bromide	0	-	-	na	4.0E+03	-	-	na	4.0E+03	-	-	na	-	-	-	4.0E+03	na	-
Methoxychlor	0	-	3.0E-02	na	-	-	-	na	3.0E-02	-	-	na	-	-	-	3.0E-02	na	-
Mirex	0	-	0.0E+00	na	-	-	-	na	0.0E+00	-	-	na	-	-	-	0.0E+00	na	-
Monochlorobenzene	0	-	-	na	2.1E+04	-	-	na	2.1E+04	-	-	na	-	-	-	2.1E+04	na	-
Nickel	4.77	2.3E+02	2.5E+01	na	4.6E+03	2.3E+02	2.5E+01	na	4.6E+03	-	-	na	-	-	-	2.3E+02	2.5E+01	na
Nitrate (as N)	0	-	-	na	-	-	-	na	-	-	-	na	-	-	-	na	-	-
Nitrobenzene	0	-	-	na	1.9E+03	-	-	na	1.9E+03	-	-	na	-	-	-	1.9E+03	na	-
N-Nitrosodimethylamine <sup>c</sup>	0	-	-	na	8.1E+01	-	-	na	8.1E+01	-	-	na	-	-	-	8.1E+01	na	-
N-Nitrosodiphenylamine <sup>c</sup>	0	-	-	na	1.6E+02	-	-	na	1.6E+02	-	-	na	-	-	-	1.6E+02	na	-
N-Nitrosod-n-propylamine <sup>c</sup>	0	-	-	na	1.4E+01	-	-	na	1.4E+01	-	-	na	-	-	-	1.4E+01	na	-
Parathion	0	6.5E-02	1.3E-02	na	-	6.5E-02	1.3E-02	na	-	-	-	na	-	-	-	6.5E-02	1.3E-02	na
PCB-1016	0	-	1.4E-02	na	-	-	-	na	1.4E-02	-	-	na	-	-	-	1.4E-02	na	-
PCB-1221	0	-	1.4E-02	na	-	-	-	na	1.4E-02	-	-	na	-	-	-	1.4E-02	na	-
PCB-1232	0	-	1.4E-02	na	-	-	-	na	1.4E-02	-	-	na	-	-	-	1.4E-02	na	-
PCB-1242	0	-	1.4E-02	na	-	-	-	na	1.4E-02	-	-	na	-	-	-	1.4E-02	na	-
PCB-1248	0	-	1.4E-02	na	-	-	-	na	1.4E-02	-	-	na	-	-	-	1.4E-02	na	-
PCB-1254	0	-	1.4E-02	na	-	-	-	na	1.4E-02	-	-	na	-	-	-	1.4E-02	na	-
PCB-1260	0	-	1.4E-02	na	-	-	-	na	1.4E-02	-	-	na	-	-	-	1.4E-02	na	-
PCB Total <sup>c</sup>	0	-	-	na	1.7E-03	-	-	na	1.7E-03	-	-	na	-	-	-	1.7E-03	na	-

Parameter	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Penachloropheno <sup>c</sup>	0	7.7E-03	5.9E-03	na	8.2E+01	7.7E-03	5.9E-03	na	8.2E+01	--	--	--	--	--	7.7E-03	5.9E-03	na
Phenol	0	--	--	na	4.6E+06	--	--	na	4.6E+06	--	--	--	--	--	--	--	8.2E+01
Pyrene	0	--	--	na	1.1E+04	--	--	na	1.1E+04	--	--	--	--	--	--	--	4.6E+06
Radionuclides (pCi/l) except Beta/Photon)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	1.1E+04
Gross Alpha Activity (mrem/yr)	0	--	--	na	1.5E+01	--	--	na	1.5E+01	--	--	--	--	--	--	--	1.5E+01
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	4.0E+00	--	--	--	--	--	--	--	4.0E+00
Sodium-23	0	--	--	na	8.0E+00	--	--	na	8.0E+00	--	--	--	--	--	--	--	8.0E+00
Sulfur-35	0	--	--	na	2.0E+04	--	--	na	2.0E+04	--	--	--	--	--	--	--	2.0E+04
Selenium	0.828	2.0E+01	5.0E+00	na	1.1E+04	2.0E+01	5.0E+00	na	1.1E+04	--	--	--	--	--	--	--	1.1E+04
Silver	1.103	5.3E+00	--	na	--	5.3E+00	--	na	--	--	--	--	--	--	--	--	5.3E+00
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane <sup>c</sup>	0	--	--	na	1.1E+02	--	--	na	1.1E+02	--	--	--	--	--	--	--	1.1E+02
Tetrachloroethylene <sup>c</sup>	0	--	--	na	8.9E+01	--	--	na	8.9E+01	--	--	--	--	--	--	--	8.9E+01
Thallium	0	--	--	na	6.3E+00	--	--	na	6.3E+00	--	--	--	--	--	--	--	6.3E+00
Toluene	0	--	--	na	2.0E+05	--	--	na	2.0E+05	--	--	--	--	--	--	--	2.0E+05
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--
Toxaphene	c	7.3E-01	2.0E+04	na	7.5E-03	7.3E-01	2.0E+04	na	7.5E-03	--	--	--	--	--	--	--	7.5E-03
Tributyltin	0	4.6E-01	6.3E-02	na	--	4.6E-01	6.3E-02	na	--	--	--	--	--	--	--	--	4.6E-01
1,2,4-Trichlorobenzene	0	--	--	na	9.4E+02	--	--	na	9.4E+02	--	--	--	--	--	--	--	9.4E+02
1,1,2,2-Tetrachloroethane <sup>c</sup>	0	--	--	na	4.2E+02	--	--	na	4.2E+02	--	--	--	--	--	--	--	4.2E+02
Trichloroethylene	c	0	--	na	8.1E+02	--	--	na	8.1E+02	--	--	--	--	--	--	--	8.1E+02
2,4,6-Trichloropheno <sup>c</sup>	0	--	--	na	6.5E+01	--	--	na	6.5E+01	--	--	--	--	--	--	--	6.5E+01
2-(2,4,5-Trichlorophenoxy) propionic acid (Silve)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--
Vinyl Chloride <sup>c</sup>	0	--	--	na	6.1E+01	--	--	na	6.1E+01	--	--	--	--	--	--	--	6.1E+01
Zinc	19.31	1.5E+02	1.5E+02	na	6.9E+04	1.5E+02	1.5E+02	na	6.9E+04	--	--	--	--	--	--	--	6.9E+04

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
  - Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipal
  - Metals measured as Dissolved, unless specified otherwise
  - "C" indicates a carcinogenic parameter
  - Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
  - Antidegradation WLAs are based upon a complete mix.
  - Antideg. Baseline =  $(0.25(\text{WQC} - \text{background conc.}) + \text{background conc.})$  for acute and chronic
  - =  $(0.1(\text{WQC} - \text{background conc.}) + \text{background conc.})$  for human health
  - WLAs established at the following stream flows: 10:10 for Acute; 30:Q10 for Chronic Ammonia; 7Q10 for Other Chronic; 30Q5 for Non-carcinogens.
  - Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.
- | Metal        | Target Value (SSV) |
|--------------|--------------------|
| Antimony     | 4.3E+03            |
| Arsenic      | 9.0E+01            |
| Barium       | na                 |
| Cadmium      | 8.3E+01            |
| Chromium III | 5.5E+01            |
| Chromium VI  | 6.4E+00            |
| Copper       | 6.7E+00            |
| Iron         | na                 |
| Lead         | 1.1E+01            |
| Manganese    | na                 |
| Mercury      | 5.1E-02            |
| Nickel       | 1.5E+01            |
| Selenium     | 3.0E+00            |
| Silver       | 2.1E+00            |
| Zinc         | 5.8E+01            |

Note: do not use QL's lower than the minimum QL's provided in agency guidance

**APPENDIX E**

**STATS PRINTOUTS FOR COPPER AND ZINC**



10/8/2009 11:02:14 AM

Facility = Aqua Lake Land'Or WWTP  
Chemical = Copper  
Chronic averaging period = 4  
WLAa = 17  
WLAc = 11  
Q.L. = 1  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 12  
Expected Value = 3.40618  
Variance = 1.70654  
C.V. = 0.383523  
97th percentile daily values = 6.38391  
97th percentile 4 day average = 4.78261  
97th percentile 30 day average= 3.85481  
# < Q.L. = 0  
Model used = lognormal

No Limit is required for this material

The data are:

2.7  
1.5  
2.5  
5.2  
4.6  
3.6  
3.3  
4  
3.4  
4  
1.8  
3.8

10/8/2009 11:07:29 AM

Facility = Aqua Lake Land'Or WWTP  
Chemical = Zinc  
Chronic averaging period = 4  
WLAa = 150  
WLAc = 150  
Q.L. = 1  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 12  
Expected Value = 46.0509  
Variance = 235.683  
C.V. = 0.333369  
97th percentile daily values = 80.4535  
97th percentile 4 day average = 62.0186  
97th percentile 30 day average= 51.3231  
# < Q.L. = 0  
Model used = lognormal

No Limit is required for this material

The data are:

33  
22  
30  
60  
57  
58  
51  
59  
41  
37  
43  
57

10/8/2009 11:08:05 AM

Facility = Aqua Lake Land'Or WWTP  
Chemical = Zinc  
Chronic averaging period = 4  
WLAa = 150  
WLAc = 150  
Q.L. = 1  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 11  
Expected Value = 45.5878  
Variance = 249.340  
C.V. = 0.346375  
97th percentile daily values = 81.1382  
97th percentile 4 day average = 62.0678  
97th percentile 30 day average= 51.0106  
# < Q.L. = 0  
Model used = lognormal

No Limit is required for this material

The data are:

33  
22  
30  
60  
57  
58  
59  
41  
37  
43  
57